This issue of the International Journal of Web Services research (JWSR) is a collection of five papers on various topics of Web services.

Nikola Milanovic and Miroslaw Malek formally define Web services-based architecture by adopting abstract machines with composition operators. Automatic service composition is modeled as a search problem. Basic heuristic, probabilistic, learning-based, decomposition and bidirectional automatic composition mechanisms are discussed.

Ling Liu et al. explore how to semi-automatically generate WSDL-enabled wrappers to facilitate the automation of collecting and extracting data from diverse data providers. They present a service-oriented framework for development of wrapper code generators. XWRAPComposer is implemented to evaluate the approach in the context of bioinformatics applications.

Stephen Yang and Norman Shao present a prototype of a Web service that provides support of intelligent Web content search. The essential concept of the Web service is an ontology-based content model, which synergistically combines subjective information from contents with objective information from people’s perceptions. A search engine is developed to discover matching Web content by examining the descriptions of content item described in the content model.

Ying Li et al. explore automatic configuration of service-based systems based upon dynamically changing environments and service level agreements. They propose a procedure of self-reconfiguration that includes four processes: monitoring, analyzing, planning, and executing. We begin by formalizing the definition of reconfiguration. Preliminary experiments are also reported.

Juanjuan Jiang and Tarja Systä propose a UML-based approach to support the design and validation of WSDL-based Web services descriptions. UML-based profiles are specified to define structural rules of WSDL documents and basic profile recommended by WS-I organization, so as to guide the design of correct and basic profile-compliant WSDL descriptions. Tailored methods and tools are presented to perform validation checking.